WESTERN DAKOTA TECH

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July 11, 2019

Nick Wendell
South Dakota Board of Technical Education
800 Governors Drive
Pierre, SD 57501-2291

Dear Nick:

Please accept this letter and attached program prospectus as a request for Board of Technical Education approval for Western Dakota Tech to incorporate the following exit point certificate to the current Computer Aided Design program. This certificate option was developed based on discussions with industry representatives over the last academic year.

- Computer Aided Design – Mechanical
  - Graduates of this certificate will receive training in the technical mechanical courses. It is designed for students who already have a related degree but wish to specialize in mechanical design.
  - This will be a 20-credit certificate

This certificate option will be offered beginning in the Fall 2019 semester and will be for currently employed individuals that wish to increase their skills set in the mechanical design industry areas. All classes offered within this certificate option are current courses within the Computer Aided Design program.

The addition of this certificate option to the Computer Aided Design program is a great benefit to students and local industry employers. Additionally, this new option better aligns with the WDT mission "...a commitment to academic excellence to teach the knowledge, skills, and behaviors students need to be successful."

The CIP code for the Computer Aided Design – Mechanical certificate will remain the same as the current Computer Aided Design program – 15.1301.

Please let me know if you have questions.

Respectfully,

Ann Bolman, Ed.D.

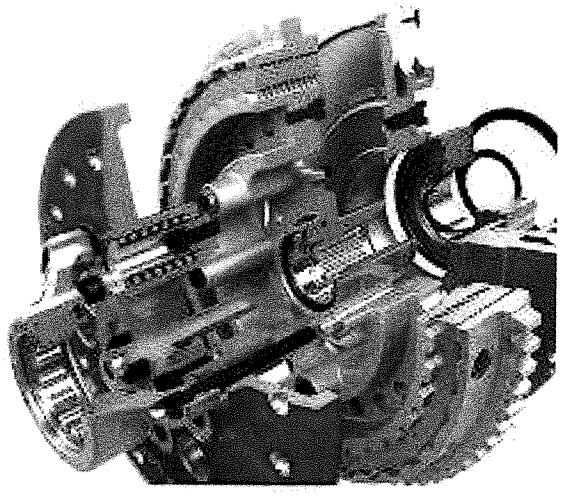
Dr. Ann Bolman
President

WESTERN DAKOTA TECH

Computer Aided Design – Mechanical Certificate

Presented to the SD Board of Technical Education July 2019

For Implementation Fall 2019



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Computer Aided Design – Architectural

EXECUTIVE SUMMARY

Western Dakota Tech's two-year associate of applied science degree in Computer-Aided Design equips students with the skills and knowledge necessary to work side-by-side with Architects and Engineers as they develop solutions for the Manufacturing and Construction industries.

Graduates of this successful program become experts in the full range of software and design concepts needed to succeed in as a CAD Technician. This degree is widely accepted as the industry standard in qualifying for an entry level position in the architectural, civil, and mechanical CAD fields. The Computer-Aided Design program at WDT provides students with a solid base of knowledge in all three of these fields, maximizing their versatility when entering the job market.

In the 2018-19 academic year, the advisory board for the Computer Aided Design program expressed the need for industry specific training in mechanical design. The ideal candidate may be a working professional with an engineering background who strictly needs the mechanical CAD skills to perform his/her job at a higher level. Local industry expressed the need for this specialized certificate option and WDT strives to meet the needs of our local industry.

IDENTIFICATION AND DESCRIPTION OF THE PROGRAM

Western Dakota Tech requests approval from the South Dakota Board of Technical Education to offer a certificate for a Computer Aided Design – Mechanical. This certificate will offer already established courses from the successful Computer Aided Design program to create a specialized certificate option.

This certificate will be comprised of educational components including: mechanical drafting, 2D and 3D CAD, mechanical print reading, engineering design, and computer automated manufacturing.

Mechanical drafters make detailed drawings, specify design dimensions and construct models of mechanical devices and parts. They work with engineers, manufacturing companies and architects, preparing blueprints and advising on construction methods and materials.

Graduates of this program will have opportunities for career choices including:

- Production Manager
- Drafter
- Mechanical Drafter
- System Designer

Students will work and study in a learning environment that will focus on problems, critical questions, and real-world case studies forming the basis for a comprehensive understanding of architectural drafting. This certificate option is a 9-month or two-semester curriculum with 20 credits which will be offered in a part-time format for added flexibility for a working professional.

OBJECTIVES AND PURPOSE OF THE PROGRAM

The primary objective of this certificate program is to prepare industry professionals with the necessary knowledge, skills, and behaviors to be successful in the mechanical design field. This will be met by providing an already established, specialized curriculum that includes classroom and hands-on experience.

Upon completion, graduates will have basic skills in:

- Basic principles of mechanical operations, component interaction, and assembly procedure
- Strategies for extracting important construction and design information from a variety of print drawings
- Proficiency in computer aided designing and completing mechanical drawings
- Basic principles of parametric 3D modeling
- Advances features of parametric solid modeling
- Working knowledge and application of computer automated manufacturing
- Technologies incorporated for solving problems

METHODS OF OBTAINING THE OBJECTIVES OF THE PROGRAM

Upon receipt of the South Dakota Board of Technical Education approval, Western Dakota Tech will begin marketing and recruitment strategies for the Fall 2019 cohort. A marketing campaign to recruit students will include a comprehensive media mix. Western Dakota Tech will utiiize current faculty resources to launch this certificate option.

Western Dakota Tech provides assurance that it possesses the resources and staff necessary to:

- Develop marketing materials and recruit students
- Recruit and retain qualified staff and instructors
- Develop and administer budgets
- Make available textbooks and instructional resources
- Provide career counseling to students
- Evaluate programs and staff
- Assist students with job placement
- Provide services to non-traditional students
- Provide classrooms, equipment, and supplies

DESCRIPTION OF LABOR MARKET DEMAND OF THE UNITED STATES, SOUTH DAKOTA, STUDENT NEEDS AND INDUSTRY SUPPORT

National Data

Currently, the National Bureau of Labor Statistics classifies an individual with an emphasis in Mechanical Computer-Aided Design as a Mechanical Drafter. Employment outlook information is listed under the occupation title Drafter.

National Bureau of Labor Statistics 2016 - 2026			
Position	2016	2026	2016 - 2026 %

Drafter	207,700	222,300	7%

State / Regional Data

Like national trends and occupation titles, expertise in Mechanical Computer-Aided Design shows increasing employment numbers within South Dakota, where employers tend to label these positions similarly to the national trends.

SD Bureau of Labor Statistics 2016 - 2026			
Position	2016	2026	2016 - 2026 %
Mechanical Drafter	165	185	8.5%

Student Need

This program will provide students with an opportunity to enter an industry that has many areas for growth, and training that meets local industry need. Graduates will already be working in a professional field and will utilize skills gained in the program to enhance their knowledge in specialized mechanical drafting.

Industry Support

Western Dakota Tech has consulted with multiple industry representatives in the western South Dakota and surrounding region and has received a very strong level of support from the Computer Aided Design advisory board. Industry leaders have indicated that there is growth for this field with no training programs in South Dakota and no short-term training programs within the state specific to mechanical drafting.

POPULATION SERVED BY THE PROGRAM

This program is available to any applicant who successfully completes the Western Dakota Tech admissions requirements and has Program Director approval. Western Dakota Tech does not discriminate in its educational programs on basis of race, color, creed, religion, age, sex, disability, national origin or ancestry. The program will draw its students from South Dakota and surrounding states, and the opportunities for employment will favor the same geographical area.

PROGRAM CAPACITY

Starting Semester	Delivery Format	Cohort Capacity
Fall 2019	Traditional Day	24

ENTRY AND EXIT POINTS

Entry point: Fall Semester 2019
Exit point: First graduating cohort in Spring 2020 with a Computer Aided Design – Mechanical certificate.

PROGRAM DUPLICATION

Western Dakota Tech is proposing this certificate option to meet regional industry needs for Mechanical Drafters. There are currently no similar certificate programs in South Dakota, and the needs of industry in western South Dakota and the region are growing.

Other South Dakota Technical Institutes – Southeast Tech has an Engineering Technology (Architectural and Mechanical) AAS degree program, Mitchell Tech has an Architectural Design & Building Construction AAS degree option, and Lake Area Tech has no related program

Montana – 0 certificate programs

Nebraska – 0 certificate programs; Western Nebraska Community College has a Pre-Engineering AS degree program

North Dakota – 0 certificate programs; United States Tribal College has a Pre-Engineering AS degree program, North Dakota State College of Science has an Architectural Drafting & Estimating AAS degree program, Cankdeska Cikana Community College has a Pre-Engineering AS degree program

Wyoming – 1 certificate program in Engineering Technology (Civil) at Sheridan College, Laramie County Community College has an Engineering AS degree program

CIP CODE: 15.1301

WAGE FACTOR

National Wage Factor

United States Department of Labor Bureau of Labor Statistics			
Position	**25th %**	**Mean**	**75th %**
Mechanical Drafter	$44,230	$59,010	$70,190

South Dakota Wage Factor

South Dakota Department of Labor and Regulation			
Position	25th %	Mean	75th %
Mechanical Drafter	$35,788	$41,451	$47,240

FACILITY / SPACE REQUIREMENTS

There will be no facility change required for the addition of this certificate option. The academic coursework is currently established and part of an already successful program.

STAFF CERTIFICATION

Western Dakota Tech plans to utilize the expertise of our two current full-time faculty members of the Computer Aided Design Program for the instruction of the courses within this mechanical certificate option. Currently, there are no industry required staff certifications needed to teach in this specialized area beyond the South Dakota Post-secondary Teaching Credential. Current faculty members hold degrees in Computer Aided Drafting, Technical Occupations, and Engineering Mechanics respectively. They also hold certifications in Autodesk Certified Professional- Revit Architecture, AutoCAD Certified Professional, and Autodesk Inventor Certified Professional.

PROJECTED BUDGET

Projected Expenses	Year 1	Year 2	Year 3
Salaries	-	-	-
Adjunct Instructor Expense	4,000	4,000	4,000
Benefits	-	-	-
Staff Travel	1,000	1,000	1,000
Instructional Materials and Software	-	-	-
Facility Changes – Materials & Labor	-	-	-
Equipment Purchases	-	-	-
Software/Books/Fees	-	-	-
	$ 5,000	**$ 5,000**	**$ 5,000**

CURRICULUM DESIGN

Western Dakota Tech designed a tentative curriculum after an extensive review of curriculum searches, academic review of required skills, and discussion with industry professionals. The curriculum is shown in Appendix A.

APPENDIX A – COMPUTER AIDED DESIGN – MECHANICAL CERTIFICATE CURRICULUM

COMPUTER AIDED DESIGN - MECHANICAL

Certificate, 20 Credit Hours, 9-Month Program

The Computer-Aided Design program at WDT equips students with the skills and knowledge necessary to produce accurate technical drawings using industry standard CAD systems.

Graduates of this certificate receive training in only the technical mechanical courses. It is designed for students who already have a related degree but wish to specialize in mechanical design.

Course	No.	Course Title	Credits
CAD	101	DRAFTING FUNDAMENTALS	3
CAD	139	2D CAD	3
CAD	142	MECHANICAL 3D CAD	3
CAD	232	MECHANICAL PRINCIPLES	3
CAD	234	MECHANICAL PRINT READING	2
CAD	244	3D ENGINEERING DESIGN	3
CAD	247	COMPUTER AUTOMATED MANUFACTURING	3
		Total	20

Some courses are offered only in certain semesters.

Completion of the full certificate is not possible in two consecutive semesters.

See Program Director for enrollment approval.

Semester Breakdown Certificate

First Semester		CR
CAD 101	Drafting Fundamentals	3
CAD 139	2D CAD	3
CAD 142	Mechanical 3D CAD	3
	Total Credit Hours	**9**

Second Semester		CR
CAD 232	Mechanical Principles	3
CAD 234	Mechanical Print Reading	2
CAD 244	3D Engineering Design	3
CAD 247	Computer Automated Manufacturing	3
	Total Credit Hours	**11**

Certificate Course Sequence and Course Descriptions

First Semester		Credits
CAD 101	**Drafting Fundamentals** The student is introduced to the fundamentals of drafting for the architectural, civil, and mechanical fields. The course covers the principles of board drafting, use of equipment, orthographic drawings, shape description, isometric drawings, and basic design concepts. The course strives to develop good drafting habits, technical abilities, and communication and teamwork skills.	3
CAD 139	**2D CAD** This course introduces the concept of 2D CAD using the latest release of AutoCAD, and covers skills ranging from basic to advanced. Basic Draw and Modify commands will be studied, as well as advanced concepts such as Layers, Blocks, Annotations, X-Referencing, and Document Creation. Students will also learn proper computer care, file manipulation, and storage.	3
CAD 142	**Mechanical 3D CAD** This course introduces industry standard 3D CAD applications for the mechanical field. The course covers the basics of parametric 3D modeling including the concepts of parts, assemblies, and drawings.	3
	TOTAL CREDITS	**9**
Second Semester		**Credits**
CAD 232	**Mechanical Principles** This course equips the student with basic principles of mechanical operations, component interaction, and assembly procedure.	3
CAD 234	**Mechanical Print Reading** Students will learn to read a variety of prints from different industries and to extract important construction and design information from each drawing.	2
CAD 244	**3D Engineering Design** This course covers advanced features of parametric solid modeling including the concepts of parts, assemblies, drawings, sheet metal design, and animation.	3
CAD 247	**Computer Automated Manufacturing** This course covers a working knowledge and application of computer automated manufacturing.	3
	TOTAL CREDITS	**11**

CATERPILLAR®

President Bolman
Western Dakota Tech
800 Mickelson Drive
Rapid City, SD 57703

President Bolman,

It is my pleasure to write a letter of support for the proposal Western Dakota Tech is submitting for certificate options for architectural and mechanical drafting as part of their already established Computer Aided Design program.

As part of the advisory board for the Computer Aided Design program, I have been involved in industry dialogue regarding the need for this type of specialized training in western South Dakota. It is critical that a highly trained workforce is available to serve our industry now and into the future. Based on feedback provided by the advisory board, we believe Western Dakota Tech has created a solution to help us with this.

Caterpillar fully supports the efforts of Western Dakota Tech as it seeks approval to establish this certificate option.

Jessica H Bradley
Design Supervisor 1

Tri-Tech Manufacturing, Inc.
333 Turbine Drive
Rapid City, SD 57703
605-721-9780
shawn@ttmi.us.com

July 11, 2019

President Bolman
Western Dakota Tech
800 Mickelson Drive
Rapid City, SD 57703

Subject: **CAD Certificate Options**

President Bolman,

It is my pleasure to write a letter of support for the proposal Western Dakota Tech is submitting for certificate options for Architectural and Mechanical drafting as part of their already established Computer Aided Design program.

As part of the advisory board for the Computer Aided Design program, I have been involved in industry dialogue regarding the need for this type of specialized training in western South Dakota. It is critical that a highly trained workforce is available to serve our industry now and into the future. Based on feedback provided by the advisory board, we believe Western Dakota Tech has created a solution to help us with this challenge.

Tri-Tech Manufacturing fully supports the efforts of Western Dakota Tech as it seeks approval to establish this certificate option.

Regards,

Shawn Gab
Tri-Tech Manufacturing, Inc.